



National Transportation Safety Board Aviation Accident Final Report

Location:	LACEY TOWNSHIP, NJ	Accident Number:	NYC90MA009
Date & Time:	10/10/1989, 1329 EDT	Registration:	N21FL
Aircraft:	AGUSTA A109A MKII	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	5 Fatal
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

AS THE HELICOPTER WAS IN CRUISE FLT AT AN ALT OF 2200' MSL, A PORTION OF ONE OF THE MAIN ROTOR BLADES SEPARATED. THE SUBSEQUENT IMBALANCE RESULTED IN SEPARATION OF THE TRANSMISSION & MAIN ROTOR ASSEMBLY FROM THE HELICOPTER. THE HELICOPTER THEN CRASHED IN AN UNCONTROLLED DESCENT. A METALLURGICAL EXAM OF THE SEPARATED BLADE REVEALED THAT IT HAD FAILED FROM FATIGUE. THE FRACTURE HAD INITIATED AT A MANUFACTURING INDUCED SCRATCH IN THE SPAR OF THE BLADE. THE SCRATCH WAS ON THE INNER SURFACE OF THE SPAR AT BLADE STATION 2825 (IN MILLIMETERS), NEAR THE LEAD BALANCE WT. IT WAS IN LINE WITH THE EDGE OF THE ADHESIVE FILET. THERE WAS EVIDENCE THAT THE CRACK ORIGINATED WHERE A SHARP TOOL WAS USED TO TRIM THE EDGE OF THE ADHESIVE FILET. THE BLADE FRACTURED AFTER 922 HRS OF OPERATION.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: IN-FLIGHT SEPARATION OF A MAIN ROTOR BLADE DUE TO FATIGUE FAILURE OF THE MAIN ROTOR BLADE SPAR, WHICH ORIGINATED AT A MANUFACTURING INDUCED SCRATCH (TOOL MARK) THAT WAS THE RESULT OF INADEQUATE QUALITY CONTROL.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION

Phase of Operation: CRUISE - NORMAL

Findings

1. (C) ROTOR SYSTEM,MAIN ROTOR BLADE SPAR - FATIGUE
2. (C) INADEQUATE QUALITY CONTROL - MANUFACTURER
3. (C) ROTOR SYSTEM,MAIN ROTOR BLADE - SEPARATION

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

Pilot Information

Certificate:	Flight Instructor; Commercial	Age:	27, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Helicopter	Toxicology Performed:	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	05/25/1989
Occupational Pilot:	Last Flight Review or Equivalent:		
Flight Time:	2900 hours (Total, all aircraft), 100 hours (Total, this make and model), 2900 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 40 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	AGUSTA	Registration:	N21FL
Model/Series:	A109A MKII A109A MKII	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	7309
Landing Gear Type:	Retractable - Tricycle	Seats:	7
Date/Type of Last Inspection:	09/03/1989, 100 Hour	Certified Max Gross Wt.:	5730 lbs
Time Since Last Inspection:	47 Hours	Engines:	2 Turbo Shaft
Airframe Total Time:	911 Hours	Engine Manufacturer:	ALLISON
ELT:	Not installed	Engine Model/Series:	250-C20B
Registered Owner:	FSQ AIR CHARTER CORP.	Rated Power:	420 hp
Operator:	PARAMOUNT AVIATION	Operating Certificate(s) Held:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	DAGA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	WRI, 65 ft msl	Distance from Accident Site:	22 Nautical Miles
Observation Time:	1355 EDT	Direction from Accident Site:	330°
Lowest Cloud Condition:	Unknown / 0 ft agl	Visibility	7 Miles
Lowest Ceiling:	Broken / 4000 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	190°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	16° C / 3° C
Precipitation and Obscuration:			
Departure Point:	NEW YORK CITY, NY (6N4)	Type of Flight Plan Filed:	Company VFR
Destination:	ATLANTIC CITY, NJ (ACY)	Type of Clearance:	None
Departure Time:	1302 EDT	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	3 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	5 Fatal	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	ALAN J YURMAN	Report Date:	05/18/1992
Additional Participating Persons:	KIRK P JAEGER; PHILADELPHIA, PA RICHARD MARTZ; WASHINGTON, DC		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB’s investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB’s Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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